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NAVAL WAR COLLEGE  
Newport, R.I.

ANTISUBMARINE WARFARE:  
CONSIDERATIONS FOR FUTURE OPERATIONS  
IN THIRD WORLD REGIONS

by

J. Daniel Withers

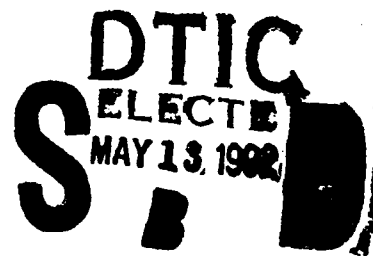
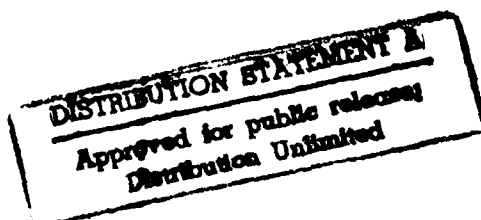
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A paper submitted to the faculty of the Naval War College in partial satisfaction of the requirements of the Department of Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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Recent world change requires that the United States Navy review strategic objectives, operational concepts, and supporting warfare applications - among them antisubmarine warfare (ASW). This paper will review possible implications from an ASW perspective as the United States shifts its focus from the Ex-Soviets (now Russia, or Commonwealth of Independent States) to the Third World. The purpose of this paper is not to speculate in which areas the United States might become involved. Nor will the paper address detailed strategic or tactical implications. Instead, this paper addresses what operational ASW-related areas might possibly require review and modification, providing rationale regarding why these areas might be affected. Antisubmarine warfare doctrine in the past has focused on the Ex-Soviet nuclear submarine threat operating in open "blue water". New doctrine and operational concepts must be developed which are applicable to conventionally-powered (non-nuclear propulsion) submarines operated by Third World countries in littoral shallow water regions. Revised concepts must be developed which, among other things, consider threat diversity, the environment, technology, and other factors influencing ASW's contributions to potential future "campaigns" in Third World regions.

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ANTISUBMARINE WARFARE:  
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CHAPTER I

INTRODUCTION

The Problem. The dissolution of and reduced threat from the Ex-Soviet Union (now Russia, or Commonwealth of Independent States) has necessitated responsive changes across a broad continuum within the United States - including reviewing and modifying the National Security Strategy, Maritime Strategy, and a multitude of military doctrines and operational concepts. One such area warranting review is an important naval operational warfare area - antisubmarine warfare (ASW). In light of extensive submarine inventories in Third World regions and the likelihood of continued United States involvement in those areas, ASW will most likely play an important role in the United States' ability to project power or demonstrate forward presence in support of national security and maritime strategies. Presently, the scope of the proposed review does not need to speculate in which areas the United States might become involved, but it should address the potential operational effects associated with shifting focus from concepts developed to confront the Ex-Soviet nuclear submarine threat in open blue water, to concepts more applicable to conventionally-powered (non-nuclear propulsion) submarines operated by Third World countries in the shallow

waters of littoral regions.

Linkage to National Security and Maritime Strategies. Is there a linkage between the United States' national security and maritime strategies and operational-ASW? From a strategic perspective, on a broad scale the United States is shifting from preparedness for a global conflict to contingency operations on a more regional level. At the global level, the United States focused principally on the Ex-Soviet Union. As the focus is shifted, the United States is redirecting much of its emphasis to Third World countries, many of which have sophisticated warfighting capabilities, including submarine forces with advanced propulsion, weapons, sensor and signal processing technologies incorporated. The bottom line is that Third World submarines are plentiful and capable.

Predicting strategic intentions is difficult. However, while pursuing strategic or operational objectives and in the event of conflict, most Third World countries likely would employ submarines in territorial and contiguous waters. These waters generally are shallow and present geographically-imposed maneuvering restrictions. Operating in such an environment has important implications for antisubmarine warfare. The United States Navy's ability to conduct successful ASW operations within that environment will have a major impact on its ability to gain control of the seas - whether denying it to an adversary or protecting it for self use - in support of

forward presence and power projection operations in Third World regions.

A capable Third World submarine poses a real and serious threat to United States naval forces operating in littoral waters. The threat could present itself in absolute terms - by attacking and sinking a United States Navy ship, or it could present itself in more abstract terms - by presenting a threat "in being." If the United States involves itself in Third World regions where a *potential* submarine threat exists, operational planning and execution both will be affected. The threat capability must be ascribed to the enemy and its possible effect upon United States naval forces' courses of action must be evaluated. If a real or potential submarine threat prevents or hampers presence, power projection, or other operations, achieving strategic objectives may be jeopardized. Therefore, we can conclude that there is a real and absolute linkage between the United States' national security and maritime strategies and an ability to conduct successful ASW operations.

Influences on Third World Region ASW Operations. What will influence the United States Navy's ability to conduct successful ASW operations in Third World regions? To respond we must consider the various major "drivers" - from systems development to operational initiatives - which will play a predominant role in ASW operations conducted in those areas.

These drivers generally can be classified under the headings "Threat", "Environment", "Own Forces", and "Political".

Examples of "threat drivers" which must be considered when operating in the Third World littoral environment include threat diversity (multiple submarine classes/types and weapons), capability (propulsion, weapons, and sensors), inventory (a larger Third World inventory when considered in the aggregate, but fewer submarines on a per-country basis vis-a-vis the historical Ex-Soviet threat), and maneuverability (limited seaward reach).

"Environmental drivers" predominantly are influenced by the marginal acoustic conditions (characterized by high noise and reverberation) associated with shallow water. Such an acoustic environment makes detecting submarines more complicated and difficult. Additional environmental drivers could be influenced by factors associated with operating in close proximity to hostile shores or in unusual physical environments, the potential adversary's "home field" advantage, and, conversely, the projecting force's operational uncertainty and geographic unfamiliarity with Third World regions.

"Own force drivers" could perhaps be described in terms of what the United States Navy must do to address its limited historical data regarding Third World submarine forces, the long supply lines that would need protection against hostile submarine forces, the limited past focus on training conducted for Third World operations, and the uncertainty regarding



force mix optimization for the Third World threat.

"Political drivers" could be characterized as popular support for contingency operations and the potential effect that might be superimposed on that support by a Third World submarine attack against a major United States Navy combatant. Incorporated in this concern is the risk of considerable personnel casualties and collateral damage. The difficulty in defining appropriate rules of engagement might also be included as a driver in this area.

Conclusions. From a practical point of view, United States military force deployment and employment will continue in support of forward presence and power projection missions while pursuing national security and maritime objectives. Consequently, carrier battle group, amphibious, strike, even freedom of navigation operations - all potentially could be affected by the presence of a capable Third World submarine threat. Historically, at the operational level the United States Navy has employed a combined arms approach to ASW, building upon a framework founded upon the Composite Warfare Commander (CWC) Doctrine/Concept. Generally, such operational concepts and doctrine might remain valid for future "campaigns" involving Third World countries; however, at a lower end of the operational spectrum the United States Navy must review some of the details regarding how operations might be conducted in view of a revised threat.

Additionally, current ASW systems have been optimized for a nuclear submarine threat in an open blue water environment. Generically redefining the threat as conventionally-powered submarines operating in shallow, restricted waters necessitates a review of ASW platform, sonar, sensor, signal processing, and weapon system acquisition priorities.

In summary, redefining the submarine threat poses wide-ranging operational implications for future ASW operations. Technological and environmental factors, and operational and tactical concepts will be critical considerations.

## CHAPTER II

### NATIONAL SECURITY AND MARITIME STRATEGIES - WHAT ROLE DOES ASW PLAY?

ASW Linkage to Strategies. Although concerned principally with operational considerations in this paper, a brief review is in order to summarize ASW's linkage to national strategic interests and objectives.

The United States' broad national security interests and objectives that give coherence to its national strategy are:

- \* The survival of the United States as a free and independent nation
- \* A healthy and growing economy to ensure opportunity for prosperity and resources for national endeavors at home and abroad
- \* Healthy, cooperative and politically vigorous relations with allies and friendly nations
- \* A stable and secure world, where political and economic freedom, human rights and democratic institutions flourish<sup>1</sup>

The national military objectives which support national interests and objectives include:

- \* Deterring or defeating aggression in concert with allies
- \* Ensuring global access and influence
- \* Promoting regional stability and cooperation<sup>2</sup>

Certainly achieving these national strategic and military objectives does not convey an isolationist approach. Consequently, the United States' revised National Security Strategy includes two fundamental demands which will play an important role in shaping planning efforts for potential future ASW operations: exercising forward presence in key areas; and responding effectively to crises.<sup>3</sup> The United States' Maritime Strategy has been recalibrated to support higher level strategies through maritime superiority and power projection.<sup>4</sup> Executing those actions necessary to achieve strategic goals and objectives will require that the United States continue to deploy its maritime forces on a global scale. Such deployments could require sending military forces in harm's way while responding to potential crises or protecting vital interests. "Harm's way" as it pertains to this paper means sending naval forces into areas where a potential submarine threat exists. If intending to operate in those areas, the Navy must retain a capability to conduct successful ASW operations. So ASW could potentially play a key role in achieving tactical and operational success while pursuing larger strategic goals. Conducting successful ASW will contribute significantly to the United States' ability to control the seas - whether denying its use to an adversary or protecting its use for self interests. Desert Shield validated the efficacy of sea denial as a major element contributing to success of the land campaign. There is no reason

to believe that sea control will play any less important role in future campaigns. But how would Desert Storm's outcome have differed had a submarine threat existed? How could other potential campaigns be influenced by the presence of a submarine threat? To answer those questions, we must first look at the scope of the ASW problem.

## CHAPTER III

### THE THREAT

The Historical Soviet Threat. The Ex-Soviet (now Russia, or Commonwealth of Independent States) threat preoccupied the United States' tactical, operational and strategic thoughts throughout the Cold War. The dissolution of the Soviet Union does not completely eliminate that threat. Until the political situation stabilizes in the newly formed Russian government and other independent states, and until massive military cutbacks are realized, the United States and NATO are obliged to counter the existing, albeit now muted, and near-term threat - more than 300 Russian submarines, the world's largest undersea force.<sup>5</sup> Included in that force are significant numbers of ballistic missile submarines, against which United States ASW forces must retain an ability to counter. Moreover, despite recent Russian political developments, submarine construction continues. In 1990, the Ex-Soviet Union launched ten new submarines, six of them nuclear-powered, with formidable modern weapons and sensors. Not only is there no indication that this building program is declining, but there are now confident forecasts of new generations of nuclear-powered attack classes, and air-independent propulsion conventional submarines coming into service by the mid-1990's.<sup>6</sup> In light of the Russian

government's pressing requirement to generate hard currency in the face of economic hardship, the United States cannot ignore the possibility that some of these new and capable submarines, through foreign military sales programs, could find their way into Third World fleets. Even should Russia not pursue foreign military sales to generate hard currency, already there is a formidable Third World threat - in both current inventories and indigenous building programs to increase those inventories.

The Revised Threat. Apart from the United States and Russian navies, over 40 other countries operate more than 400 submarines. Nearly half operate under the flags of Third World countries.<sup>7</sup> Diesel-electric submarine proliferation is extensive. Ex-Soviet KILO-Class, West German Type 209, British OBERON-Class and Type 540, and French AGOSTA- and DAPHNE-Class submarines illustrate some of the more modern submarine types currently held in Third World inventories.<sup>8</sup>

High technology transfers to Third World countries will only improve current capabilities. Diesel submarines have always been difficult to locate passively while operating submerged on battery at low (non-cavitating) speeds. Operating so, they exhibit limited exploitable passive narrowband acoustic signatures and very low broadband radiated noise. The historical achilles heel for diesels has been their requirement to snorkel periodically to recharge

batteries. Recent propulsion technology developments are changing that. In addition to improved diesel propulsion systems, which have radically reduced snorkel acoustic signatures, high-density batteries and air independent propulsion (AIP) technologies are reducing snorkeling requirements - both in frequency and time spent snorkeling. Closed-cycle diesel engines, fuel cells, Stirling engines, and low-power nuclear reactors are examples of other improved propulsion quieting and endurance technologies which, simply by making it harder to find the threat, will present complex operational concerns. To illustrate, passively searching for the submerged diesel-electric submarine is problematic. To locate a submarine, ASW forces in the past predominantly have relied on detecting the submarine's transmitted acoustic energy. For diesel-electric submarines, transmitted acoustic energy is directly related to, among other things, speed, propulsion and auxiliary machinery acoustic isolation/dampening system effectiveness, and how often and how long snorkeling is required. Improved propulsion systems increase endurance while reducing transmitted acoustic energy and snorkeling requirements. The net effect of propulsion system improvements is to reduce detection opportunities for ASW forces. Consequently, locating submarines could often depend on shifting to active search techniques. Actively searching relinquishes several tactical advantages retained by passively operating ASW forces - the most notable advantage yielded



being stealth. In combination with searching passively, surface ASW forces contribute to stealth by employing their own propulsion quieting systems - denying the threat submarine passive counter-detection opportunities. However, whatever systems or tactics utilized, a surface ship yields its stealth advantage the moment active sonar is employed. With the threat operating quiet propulsion systems and proving more difficult to detect, ASW forces likely will need to actively search - yielding an advantage and creating a significant operational concern.

Submarine weapons proliferation is an additional concern. Third World countries possessing modern submarines with capable weapons systems introduce operational considerations of a different nature. No longer is the threat simply a vintage World War II electric, straight-running torpedo. Ex-Soviet exported submarines are equipped with 53 centimeter (cm.) torpedoes with thermal propulsion systems that have relatively long endurance and high-speed features. Ex-Soviet torpedoes also have large 400-kilogram (KG) warheads.<sup>9</sup> Western exports include wire-guided and advanced acoustic homing capabilities.<sup>10</sup> Such weapons can be employed with devastating results. Consider recent examples in which less lethal weapons have been employed with sobering consequences. Recall that the United States frigate *Samuel B. Roberts* (FFG-58) was nearly sunk by a 100-125 KG World War I design mine in the Persian Gulf. During the Falklands conflict, the

Argentine cruiser *Belgrano* was sunk by two 340 KG British MK-8 torpedoes. These straight-running torpedoes, based on designs more than 50 years old, killed 368 Argentine sailors.<sup>11</sup> If while pursuing national strategic goals a major United States warship were sunk with such casualties, the potential negative effect on national resolve and morale could be decisive in continued pursuit of those objectives in that particular region. At any rate, the objective's cost goes up. The Third World submarine weapons threat is not limited to torpedoes. Many modern antiship cruise missiles can be launched from 53 cm. torpedo tubes. Exported Western technology also has contributed to the potential threat; West German Type 209-1500 and French RUBIS-Class submarines either can be modified or already possess the capability of submerged launch Harpoon and Exocet antiship missiles.<sup>12</sup> These weapons extend the threat horizon and place at greater risk United States naval forces employed in various theaters of operation.

Potential for Operations in Third World Regions. But where is the threat? The purpose of this paper is not to speculate where the United States might employ forces. However, for illustrative purposes, it is not hard envision a Libyan submarine attacking United States naval forces engaged in freedom of navigation or other operations in the Gulf of Sidra. Could submarine proliferation also raise the possibility of terrorist groups acquiring submarines (or "mini-sub")

on a more modestly affordable level) and posing a threat to United States forces globally deployed? I consider the possibility real. A more general statement worth noting is that in 1990 there were more than 20 violent political conflicts involving up to 42 countries on six continents, one third classified as outright war. United States Department of State analysts argue that half of these could, in this decade, expand and require United States actions ranging from military logistics support to employment of force.<sup>13</sup> United States engagement in small wars has a long and controversial history. At present, with historical transformations underway in Eastern Europe and Russia causing the security dimension of East-West competition to fade, global containment of communist expansion has become a largely residual justification for United States involvement in Third World conflicts.<sup>14</sup> These arguments lend substance to arguments that the United States likely will continue its involvement in Third World affairs; however, such forecasts and justification notwithstanding, "Third World" plus "submarine" does not equal "threat". In any case, responding to crisis or contingency requires evaluating what military capabilities exist in that area. Capabilities define potential courses of action that might be taken against United States forces responding to crises or contingencies in Third World littoral waters. If a Third World country possesses a capable submarine force, additional courses of action are available that might not otherwise be

considered. As briefly illustrated, any number of future potential scenarios could place the United States in a position requiring force employment and, with proliferation so widespread, facing a submarine threat. Therefore, where the potential threat might be is worth review.

Appendices I and II list respective examples of Western and Non-Western diesel-electric submarine exports to Third World countries.<sup>15</sup> The lists are not all-inclusive, yet they represent the disturbing trend of proliferation. Additionally, five nations produce nuclear submarines (The United States, Russia, Britain, The Peoples Republic of China, and France), with three or four of these nations willing to sell, rent, or lease.<sup>16</sup> As though the diesel submarine threat were not sufficient, various other nations (most notably Brazil, Canada, India, Spain, Pakistan, Turkey, and Argentina) have shown interest in acquiring or indigenously producing their own nuclear submarines.<sup>17</sup> Are these countries all threats? No. But these facts illustrate the potential problems posed by proliferation - threat diversification through aggressive acquisition or building programs. The bottom line is that on an increasing basis, many Third World countries, some posing potential threats to United States interests, are finding submarines an affordable and attractive capability to be used in furthering their own objectives. The United States can only assume that a country will use a submarine if it has one. That assumption must be incorporated

into any future planning activities.

Other Influential Factors. Having defined the threat from regional and technological perspectives, what other definitive factors apply? As always in ASW, the environment plays a critical role. For the most part, geographic and oceanographic location define the threat environment. A reasonable position to take is that most Third World countries possessing submarines are presently incapable of or do not have grand designs of achieving maritime superiority on a global, blue water scale. Indeed, despite improved conventional propulsion technologies, most Third World submarine operations would likely have limited seaward reach. Most submarine-capable Third World countries likely would operate in littoral, territorial or contiguous areas (I find it worth noting, however, that in the Falkland's conflict, the Argentine submarine *San Luis* traveled 800 nautical miles from its base, conducted a six-to-seven-week patrol, and generated three torpedo attacks.<sup>18</sup>) Littoral areas generally are categorized by shallow water, which presents special environmental concerns. Without going into a long dissertation regarding underwater acoustics, suffice to say that operating in shallow water severely degrades passive acoustic detection probabilities. Instead of longer range passive detections, measured in several miles, as could be anticipated in deeper waters, shallow water passive detection ranges are more likely

to be measured in thousands if not hundreds of yards. With passive detection thus made more difficult, there is a greater likelihood of shifting to active search methods. However, actively searching in shallow water is not necessarily the panacea to overcome passive search disadvantages. In addition to yielding stealth, as already discussed, shallow water presents other problems to active search. High reverberation, bottom absorption and reflection all act to limit active detection ranges - most often to several hundred yards. So foregoing passive for active search operations does not in itself solve the detection problem. What does this mean operationally? It means a quiet diesel operating at slow speeds in shallow water could maneuver to within weapon release range without the potential target knowing the threat is present. Additionally, ASW forces operating in littoral areas might have imposed on them maneuvering restrictions created by the presence of islands, coastal irregularities, or shoal waters. Such conditions add further search restrictions and, in the event a threat weapon is launched, could limit evasive maneuver options and reduce countermeasure effectiveness.

## CHAPTER IV

### IMPLICATIONS FOR OPERATIONS

Perspective from Recent History. By reviewing the Falkland conflict, we can gain some insights about operational characteristics of modern ASW. The most noteworthy data applicable to our discussion here is drawn from the Royal Navy's employment of its modern ASW capability against a single Argentine Type 209 submarine - the *San Luis*. The British were unable to prevent two attacks on their own ships while the inexperienced *San Luis* crew eluded the best efforts of a western Navy that specializes in ASW. The British expended over 200 items of ordnance against only one Argentine submarine and a sea full of false contacts.<sup>19</sup> Certainly the munitions expenditure rate was influenced partially by a heightened anxiety level. In any case, an operational impact here is apparent: expect high ASW munitions expenditures and plan accordingly - both in procuring and deploying adequate munitions inventories, and protecting sustainment/resupply lines of communication. Additionally, imagine the impact on British operations in the Falklands if *San Luis* had been successful in sinking either *HMS Hermes* or *Atlantic Conveyor*. The potential negative impact on national resolve and popular support on the homefront is easily imagined. A reasonable position could be taken that the operational impact of the

British force losing its air support and a sizeable portion of its ground force [before they even hit the beach] would have been seriously detrimental, if not prohibitive, to the ultimate success of the Falkland operation.

"Drivers" Influencing ASW Operations. How will future ASW operations be affected? As in the past, we easily can envision United States Navy carrier battle groups responding to various crises or contingencies. Any number of scenarios could require separate or concurrent deployment of amphibious forces. As a matter of policy, naval force deployment will continue as a functional tool in striving to achieve strategic objectives. Conducting successful ASW operations in support of those objectives largely will depend on the United States' ability to respond properly to the various "drivers" affecting Third World operations. Operational thinking caps will need readjustment and systems design priorities will likely need modification. The "drivers" generally can be classified under the headings "Threat", "Environment", "Own Force", and "Political".<sup>20</sup>

"Threat drivers" are characterized by diversity. Each Third World country's particular capabilities will vary. The United States historically has developed systems for optimum performance against an extensive but more homogeneous Ex-Soviet capability. More than 40 countries possessing multifaceted submarine capabilities pose an altogether



different problem. The United States must be capable of responding across a much broader spectrum. Granted, in many Third World regions, only a few submarines can be brought to bear during any potential confrontation. Operational concepts or doctrine do not need to anticipate all Third World submarines rising simultaneously as a cooperative group against United States naval forces. However, the Falkland's example points to the difficulty presented by even a single submarine.

The United States Navy must use caution against approaching ASW operations with a superior "attitude" as well. United States ASW forces could argue that Third World submariners are untrained and do not present a formidable threat.<sup>21</sup> However, independent from the technology perspective, many Third World countries are pursuing training programs aggressively. Additionally, several characteristics of Third World contingencies may offset the limited training and operational expertise of their submarine crews. First, the Third World adversary has a mobile "home field" advantage in waters with which United States naval forces may be unfamiliar. Second, intelligence efforts, historically less focused on Third World navies, produce uncertainty and tactical unpredictability. Third, difficult rules of engagement, implemented in an effort to avoid collateral damage, may prohibit precursor operations and restrict attacks by United States ASW forces on subsurface contacts.<sup>22</sup>

"Environmental drivers" predominantly are influenced by

acoustic characteristics associated with shallow water - high ambient noise and reverberation, signal scattering and absorption, and acoustic path limitations. Operating in close proximity to hostile shores, extensive civilian merchant traffic, unusual physical environments and the uncertainty and inexperience with the various regions themselves impose complicated environmental limitations.

"Own force drivers" center primarily on the United States' ability to prepare for operations against Third World submarines. As earlier stated, the United States does not have as complete an historical Third World intelligence database from which to operate. Additionally, because the United States has no diesel submarines in its inventory, realistic training against diesel submarines has been limited to infrequent exercises with allies. Additionally, United States sonar and signal processing systems have not been developed to optimize performance in shallow water. Does that mean that the United States cannot conduct ASW in shallow water or that current systems are worthless in that environment? Hardly. But the systems have not been optimized for the shallow water environment, and those limitations must be incorporated in future planning as potential Third World operations are considered.

Finally, the "political drivers" cannot be ignored. As the United States considers crises or contingency operations in Third World regions, risk factors must be addressed.

Anticipating that naval forces will operate in close proximity to hostile shores, risks must be reassessed as combat and support units are sent in harm's way. What level of assurance is necessary that ASW efforts can protect those forces from submarine attack? What would the reaction be to major loss of life if a surface ship is sunk? On an operational level, these considerations may have serious implications on a wide variety of areas - including force composition from a deployment perspective, to force disposition, maneuver, and tactics from an employment perspective. From a strategic level, it may define whether the United States deploys forces in the first place.

Where Does United States ASW Go from Here? Responses to the new threat can be addressed from a number of perspectives - technological, doctrinal, and operational.

Technologically, in depth reviews must be conducted to identify the proper ASW force "mix", emphasizing capabilities which will permit future ASW forces to conduct effective ASW operations against the revised threat in Third World regions. Such issues normally are addressed within force structure discussions and are beyond the scope of this paper. I will simply note here that capabilities incorporated in systems developed to support future operations will influence greatly the ability to conduct ASW in shallow water regions. Future force capabilities must not necessarily be optimized for

shallow water ASW operations, but they most likely will need to have that capability improved. If the United States is to continue emphasizing passive operations then continued emphasis must be placed on developing non-acoustic detection systems. Examples under consideration would exploit laser and non-acoustic detection technologies aimed at detecting and identifying magnetic anomaly, thermal scarring, wake, and bioluminescence signatures.<sup>23,24</sup> Additionally, when considering a combined arms approach, continued emphasis must be placed on C3I systems. Of course, United States ASW forces will need both offensive and defensive weapons that can be employed in shallow waters.

Doctrinally, United States ASW forces can continue a combined arms approach, utilizing air, surface, and subsurface assets. The Composite Warfare Commander (CWC) Doctrine/Concept remains valid for employment of naval forces in crises response or contingency operations. The primary change when compared to previous force employment is the environment. The ASW Commander must understand shallow water operations and how best to employ assigned forces against a quiet threat operating in that environment. Risk assessment will play an ever increasing role since operating in shallow water will place surface forces at greater risk. If minimizing loss of surface ships is to be used as a measure of effectiveness in Third World operations, force disposition considerations will require much greater scrutiny. For example, current

amphibious operations doctrine calls for placing the landing force in close-in positions that pose an extreme risk in the face of a submarine threat. Will future amphibious operations permit positioning as close to shore as current doctrine envisions? What level of confidence do current doctrine and tactics provide regarding adequate security against a submarine threat in this new environment?

Operationally, there are numerous areas of concern. Quite obviously United States naval forces likely will be unable to sail with impunity a carrier battle group into an area in the face of a submarine threat. Deploying a Marine Expeditionary Force/Brigade into position off a Third World country's shore preparing for possible landing carries with it obvious risks. These two examples of force employment are easily visualized when considering responses to crises or contingencies. The submarine threat imposes new restrictions on those responses. Using Desert Shield/Desert Storm as a backdrop, consider the potential impact on operations had Iraq possessed and stationed a submarine in either the Red Sea, Persian Gulf, Gulf of Oman, or Straits of Hormuz. The operational picture would have been even more complex than it already was. Would the Desert Shield embargo have been as successful? Would United States carrier battle groups have been able to operate where and as they did? Would adequate security have been possible for strategic sealift/combat logistics forces required to support the air and ground

campaign? All rhetorical questions - yet all potentially legitimate in future Third World operations. Generally speaking, one can reasonably expect that, at a minimum, the United States and Coalition forces could have suffered some level of damage/loss to naval forces. As a result, the war potentially could have lasted much longer. I feel it safe to postulate that if Saddam Hussein had only one submarine, and it was engaged and destroyed after sinking only one surface ship, the United States' commitment to the conflict would have been seriously challenged had that surface ship been an aircraft carrier or other ship whose loss would have resulted in consider personnel casualties. At a minimum, the United States and Coalition forces likely would have been forced to take a step back and reevaluate operational plans. Iraq simply possessing a submarine threat would have imparted on the United States and Coalition forces a requirement to conduct maritime operations differently and more cautiously. Another dimension - a stealthy and capable dimension - would have been added to the operational equation.

The most notable effect on ASW operations in Third World regions might arguably lean toward the tactical level. How does the United States best employ its forces in the face of a capable submarine threat? As mentioned with speculative issues and force structure reviews, tactical discussions are not the object of this paper. However, a short summary of tactical options could include destroying threat submarines at

their source (i.e., at their operating bases, construction, repair and maintenance sites, etc.), in their transit and patrol areas, or containing them at their source (using mines, cordons, etc.) before they pose a problem to United States naval forces.<sup>25</sup> These options represent preemptive tactics. Other tactical options could include directly challenging the threat in the revised environment. This option would require modifying current ASW systems or developing new systems to more adequately cope with the threat in shallow water. An additional but dubious option could be simply to apply blue water tactics in shallow water regions and hope for the best. These are not insignificant matters; again however, they are worthy of much greater discussion than is permitted here. Suffice to say that whatever tactics United States naval forces do employ will have considerable impact on their success at the operational level.

## CONCLUSION/RECOMMENDATIONS

The reduced threat from Russia does not produce a completely risk free environment from a military perspective. The United States will continue reaching globally while attempting to achieve national goals and objectives. Military force employment to many Third World regions likely will be required. As military forces deploy, operational commanders must review what capabilities are ascribed to the potential adversary. If a submarine threat exists, several operational considerations will come into play.

As we have seen, the Third World submarine threat is expanding. Granted, some of the submarines in Third World inventories are characterized by older technologies. However, aggressive acquisition and expanding indigenous construction programs increase the likelihood that more capable submarines will soon appear in Third World inventories.

What does the revised threat mean to United States ASW operations? The answer lies in several areas. Future United States Navy ASW forces must be capable of successfully performing their mission in a different environment - shifting focus from open ocean, blue water to a restricted, shallow water environment. The tactics associated with ASW of necessity will change. To ensure ASW forces are capable of performing in the revised environment, technological and operational changes must also occur.



Technologically, current systems have been optimized for the Ex-Soviet threat operating in an open ocean environment. The shallow water environment poses multiple problems to submarine detection and engagement operations. In response, current systems may require modification to operate more effectively in shallow water. Future systems must incorporate improved shallow water capabilities. Additional emphasis should also be placed on developing non-acoustic detection technologies. Without these modifications and improvements, naval forces are placed at greater risk as they face a submarine threat in Third World regions.

Operationally and doctrinally, reviews must be conducted to determine the most effective force deployment and employment actions required to address a submarine threat. Carrier battle groups, amphibious groups, or other naval units operating close to hostile shores are placed at greater risk. New operational concepts must be developed which reduce that risk.

Politically and strategically, the United States must acknowledge that operating in Third World regions carries with it an ever increasing risk of personnel losses resulting from submarine attacks. When responding to crises or contingencies, the increased risks must be evaluated relative to strategic goals or objectives and the advantages gained.

Addressing these issues in combination will place the United States in a better position to deal with the Third

World submarine threat.

## APPENDIX I

### EXAMPLES OF WESTERN DIESEL-ELECTRIC SUBMARINE EXPORTS TO THIRD WORLD REGIONS

#### WESTERN EXPORTER

- Type exported

West Germany

- TR 1700, Type 209

United Kingdom

- Oberon, Vickers/Type 540  
Porpoise

France

- Agosta, Daphne

Netherlands

- Zwaardvis

#### THIRD WORLD IMPORTER

(Quantity) Type imported

Argentina (2) 209-1200,  
(2) TR 1700

Columbia (2) 209-1200

Ecuador (2) 209-1300

India (2-4) 209-1500

Indonesia (2) 209-1300

Peru (6) 209-1200

Venezuela (2) 209-1300

Brazil (1-4) 209-1400

Chile (2) 209-1300

Brazil (3) Oberon

Egypt (2-8) Oberon/Porpoise

Chile (2) Oberon

Israel (3) Type 540

Pakistan (2) Agosta, (4) Daphne

South Africa (3) Daphne

Taiwan (2) Zwaardvis

## APPENDIX II

### EXAMPLES OF NON-WESTERN DIESEL-ELECTRIC SUBMARINE EXPORTS TO THIRD WORLD REGIONS

#### NON-WESTERN EXPORTER

- Type exported

USSR

- Romeo, Foxtrot, Whiskey  
Kilo

China

- Romeo, Whiskey

#### THIRD WORLD IMPORTER

(Quantity) Type imported

China (84) Romeo

Egypt (4) Romeo

Algeria (2) Kilo, (2) Romeo

India (7) Kilo, (6) Foxtrot

(Previously leased Charlie  
class SSN returned to USSR)

Cuba (3) Foxtrot

Libya (6) Foxtrot

Syria (3) Romeo

North Korea (19) Romeo,

(4) Whiskey

## ENDNOTES

- <sup>1</sup>Joint Chiefs of Staff, National Military Strategy (Draft) (Washington, D.C.: 1991), p. 4.
- <sup>2</sup>Ibid.
- <sup>3</sup>The White House, National Security Strategy of the United States (Washington, D.C.: 1991), pp. 27-28.
- <sup>4</sup>Chief of Naval Operations, National Maritime Strategy (Unclassified portion) (Washington, D.C.:1989), pp. 3-9.
- <sup>5</sup>Chad Michelson, "Changing Undersea Threat Rolls ASW Training Waters," Armed Forces Journal International, November 1991, p. 46.
- <sup>6</sup>Richard Sharpe, Foreward to Jane's Fighting Ships 1991-1992, by Jane's Publishing (London: 1991), pp. 22-23.
- <sup>7</sup>James Fitzgerald and John Benedict, "There Is a Submarine Threat," Proceedings, August 1990, p. 58.
- <sup>8</sup>Ibid.
- <sup>9</sup>Norman Friedman, World Naval Weapons Systems (Annapolis, Maryland: Naval Institute Press, 1989), p. 424.
- <sup>10</sup>Jean Labayle Couhat and A.D. Baker III, Combat Fleets of the World 1990-1991 (Annapolis, Maryland: Naval Institute Press, 1991), p. 733.
- <sup>11</sup>Fitzgerald and Benedict, p. 61.
- <sup>12</sup>Ibid.
- <sup>13</sup>Marvin Leibstone, "Small Wars Report: A Primer," Amphibious Warfare Review, Spring 1990, p. 44.

Amphibious Warfare Review, Spring 1990, p. 44.

<sup>14</sup>Todd R. Greentree, "The United States and Politics of Conflict in the Developing World, A Policy Study" (Center Paper No. 4, Center for the Study of Foreign Affairs, 1990), p. 10.

<sup>15</sup>Data drawn from individual country summaries, Jane's Fighting Ships, July 1991.

<sup>16</sup>John Benedict, Johns Hopkins University Applied Research Laboratory, Briefing Notes on Third World Submarine Proliferation, December 1991.

<sup>17</sup>Ibid.

<sup>18</sup>Fitzgerald and Benedict, p. 63.

<sup>19</sup>Ibid.

<sup>20</sup>John Benedict, Briefing Notes.

<sup>21</sup>Peter Young, "Submarine Procurement: Some Speculations on the Process of Buying a Submarine," Asian Defence Journal, June 1991, pp. 15-16.

<sup>22</sup>Fitzgerald and Benedict, p. 62.

<sup>23</sup>Edward J. Walsh, "Navy ASW Battered by Budgetary and Technology Sea-Changes," Armed Forces Journal International, October 1991, p. 76.

<sup>24</sup>Jim Patton, "U.S. Navy Technology in the '90s," Aerospace and Defense Science, Spring 1991, pp. 58-60.

<sup>25</sup>Jan S. Breemer, "Anti-Submarine Warfare: A Strategy Primer," Naval Postgraduate School Report, Naval Postgraduate School, Monterey, CA: July 1988, pp. 8-9.

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